

Patent Claims

1. Optical layer system for reducing the reflection of optically transparent substrates, having layers of a material with a lower optical refractive index and higher optical refractive index disposed alternately on the surface of a substrate,

from which layers layer stacks (B, C, D, E) with at least one layer H of a material with a higher optical refractive index, which is enclosed by two layers made of a material with a lower optical refractive index, are formed,

the layer stacks (B, C, D, E) have an equivalent optical refractive index with respect to a prescribable wavelength λ which is lower than the optical refractive index of the substrate; thereby

at least two layer stacks are formed one above the other, the respective equivalent optical refractive index of which is reduced, starting from the substrate and

the individual layer stacks (B, C, D, E) have an optical thickness which corresponds at least to twice $1/4$ of the prescribable wavelength λ .

2. Layer system according to claim 1,
characterised in that the equivalent optical refractive index of each layer stack (B, C, D, E) is lower than the optical refractive index of a material from which layers with a lower optical refractive index are formed.
3. Layer system according to claim 1 or 2,

characterised in that none of the individual layers H and L of the layer system have an optical layer thickness which corresponds to an integer multiple of $1/4$ of the prescribable wavelength.

4. Layer system according to one of the preceding claims, **characterised in that** a layer (A) which is formed directly on the surface of the substrate and formed from a material, the optical refractive index of which is lower than the optical refractive index of the substrate, forms a $\lambda/4$ layer.
5. Layer system according to one of the preceding claims, **characterised in that** the optical refractive index of the substrate is ≤ 2 .
6. Layer system according to one of the preceding claims, **characterised in that** the layers L, the optical refractive index of which is lower, are formed from SiO_2 or MgF_2 .
7. Layer system according to one of the preceding claims, **characterised in that** the layers H, the optical refractive index of which is higher, are formed from TiO_2 , HfO_2 , ZrO_2 , Ta_2O_5 and/or Nb_2O_5 .
8. Layer system according to one of the preceding claims, **characterised in that** the individual layer stacks (B, C, D, E) are formed from three, five or seven layers.
9. Layer system according to one of the preceding claims, **characterised in that** the uppermost layer, which points in the direction of the surrounding medium and is made of the material

with a lower optical refractive index, has an optical layer thickness which is greater than $1/4$ of the prescribed wavelength λ .

10. Layer system according to one of the preceding claims, **characterised in that** the layer thickness proportion in the layer stacks (B, C, D, E) of layers H which are formed from a material with a higher optical refractive index is increased starting from the substrate surface in the direction of the surrounding medium.
11. Layer system according to one of the preceding claims, **characterised in that** the layer system has a thickness in the range between 800 to 3000 nm.
12. Layer system according to one of the preceding claims, **characterised in that** the prescribed wavelength λ is selected from the wavelength range between 480 and 600 nm.